



# *Constellation-X* SXT optics tasks at MSFC

---



Steve O'Dell, Bill Jones, & Alan Harmon  
*NASA Marshall Space Flight Center*



# MSFC FY2003 SXT optics tasks

---

## ❑ Support segmented-mirror replication experiments at GSFC.

- Process 0.5-m cylindrical metal mandrels made by Zeiss.
  - Chemically strip epoxy, clean, gold coat, and ship mandrels to GSFC.
  - Measure microroughness to evaluate surface degradation of mandrels.

## ❑ Procure and accept meter-class precision segment mandrels.

- Procure Zerodur™ segment mandrels for GSFC mirror development.
  - Received Zeiss mandrel A (30° segment, 1.6-m diameter) in 2002 Aug.
  - Receive mandrel B (1.2-m) in 2003 Mar, mandrel C (1.0-m) in 2003 Nov.
- Conduct acceptance inspection and metrology on received mandrels.
  - Complete metrology mount and modifications for segment mandrels.
  - Measure shape (coordinates), long-trace profiles, and microroughness.
- Plan for procurement of (smaller) inner-module segment mandrels in FY2004.

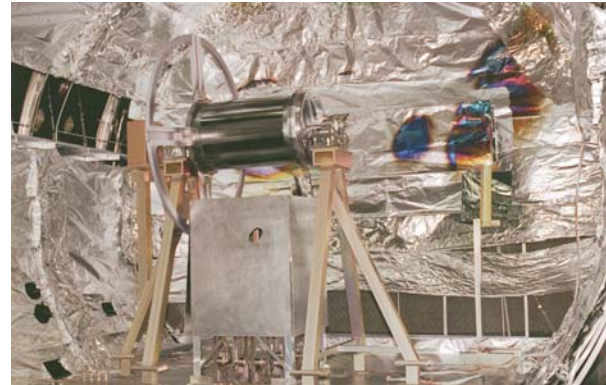
## ❑ X-ray test optics.

- Perform x-ray testing in MSFC 100-m facility.
  - Complete and commission 6-DOF optics mount and purchase x-ray CCD.
  - Conduct x-ray testing and analysis of development engineering units.

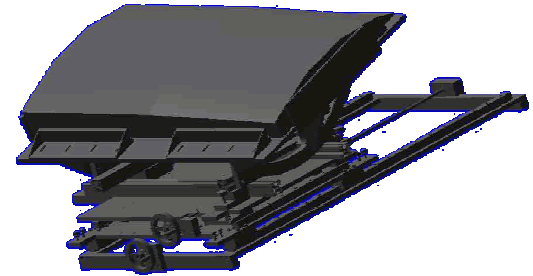


# Support for SXT development

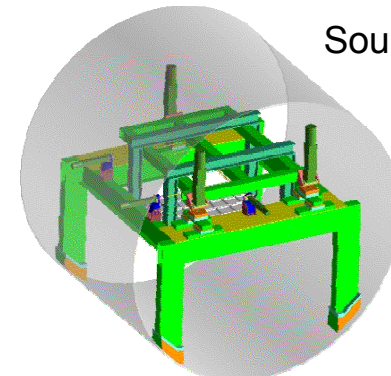
## CLEANING & COATING



## MANDREL METROLOGY



## X-RAY TESTING



Sources and detectors  
for x-ray testing  
SXT & HXT





# Precision segment mandrel A



Zerodur™  
30° segment  
1.6-m diameter  
1.1-m length  
0.5-m-long P|H  
 $\text{HPD}_{\text{geom}} < 4''$   
 $\sigma < 0.4 \text{ nm } (> 1 \text{ mm}^{-1})$

